Helicopter MedEvac for Marines In Combat

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Helicopter Medevac

- Classification: Unclassified
- Lesson Topic Number 3.0
- Lesson Time: 50 Minutes
- Question Policy: any time

Instructor Background: CDR D. B. Gillis

- Board Certified Anesthesiologist
- Designated Naval Flight Surgeon
- Flight Surgeon, HMM-164, VietNam
- Flight Surgeon, HMH-772, Det A, Desert Storm
- CO, 4th MAWMED, MAG-46

Terminal Objective

- Upon completion of this unit of instruction, the student will understand the mission of combat medevac in the USMC, and a proposed concept of organization, training, and planning.

Enabling Objectives

- 3.1 Identify the over-riding authority for US medical readiness planning and programming functions.
- 3.2 List the three types of medevac transport in the Naval Service
- 3.3 Describe the “Golden Hour” and the “Trimodal Distribution of Mortality”
- 3.4 List 4 USMC medevac missions

Criterion Test: None

Homework: None

Desert Storm Deficiencies

- **No aircrew standards, equipment (i.e. ICS with radio) or training for aeromedical crew coordination.**
- **No Flight Surgeon, Marine Aviator or Aircrewman training for Medevac missions.**

Desert Storm Deficiencies

- **No quality assurance program or results monitoring.**
- **No monitoring of civilian or military helo medevac programs for standardization or improvement of Marine program.**
- **No medical coordination of medevac missions, no uniform doctrine**

Desert Storm Deficiencies

- **No use made of ground combat casualty estimates in determining necessary helicopter assets, medical supplies or aeromedical personnel needed for aeromedical evacuation.**

Desert Storm Deficiencies

- **No interactive planning between Air and Ground Combat Element regarding placement of surgical support and collecting & clearing companies/stations relative to evacuation distance and FLOT (Flight leg distance is critical in helo productivity).**

Desert Storm Deficiencies

- **Collecting & clearing companies/stations and surgical support assets have inadequate mobility to maintain necessary proximity to FLOT.**
- **No planning for optimized mix of ground and air evacuation of casualties. Mindset of <u>either</u> air or ground transportation in forward medevac.**

Desert Storm Deficiencies

- **No Medical Regulator (HSSO) interaction until after helicopter is airborne with casualties--too late for good flight planning. DASC dropout.**
- **No Air or Ground Combat Element responsibility for comprehensive planning, training, execution or on-line direction & monitoring of medevacs.**

From the Beginning:

Question: What is the purpose of combat medical evacuation?

Answer: To conserve military manpower

..Defense Medical Standardization Board Deployable Medical Systems (DEPMEDS)

Quotes from After Action Reports

Operational Experience-Professional Knowledge, VietNam 1967, FMFRP 12-41

- "Command and control agencies authorize MEDEVAC missions under conditions which would normally cancel missions of another nature."
- "While MEDEVAC missions account for but 7.5% of total helicopter missions, such missions account for 32% of the total crew casualties resulting from enemy fire." VietNam, 1969

After Action-Desert Storm: CG,1st Marine Division

- "DASC system did not function for Medevacs."
- "Of the DASC coordinated helo medevacs instituted, most had long delays or never showed."
- "The ground medevac system was dysfunctional."
- "Locations and movements of C&CC never communicated to commanders."
- "A medical disaster was imminent up front."

After Action-Desert Storm: CG,1st Marine Division

- "Serious investigations and changes in the basic medical plan for Divisional combat medical support is recommended."
- "Though limited by T.O. for the campaign and mission planned, medevac pilots, corpsmen and physicians accounted for themselves in an exemplary fashion."

Point Paper: I MEF Surgeon, Desert Storm

Topic: FMF Air & Ground MEDEVAC Capability

- "Inadequacies in organic FMF MEDEVAC capabilities were re-discovered in ODS."
- "Many medical personnel augmenting I MEF could not fathom the lack of dedicated EVAC helicopters."
- "It is universally agreed that helicopter evacuation is the preferred method of transport. Using a "lift of opportunity" doctrine cannot be expected to achieve that in combat operations."

Point Paper: I MEF Surgeon, Desert Storm

Topic: FMF Air & Ground MEDEVAC Capability

- "Conclusion: FMF MEDEVAC means and doctrine are unsatisfactory."
- "Recommendation: The MEDEVAC issue needs urgent study to reconcile the current FMF doctrine and (deficient) organic EVAC means with potential casualty rates across the wide spectrum of Marine Corps missions and operational scenarios."

MCLLS-Phibex Ocean Venture 90

- "Joint medevac procedures, if they existed, were not adequately coordinated with all aviation units."
- "Medevac requests were confusing and uncoordinated at best."

MCLLS Phibex Valiant Blitz 91

- "The conduct of actual medevacs caused disruption in control of air support during the exercise."
- "Additionally, several unauthorized participants entered the TAR/HR net."
- "Essentially air support ceased and the routine medevac became a show stopper."

MCLLS Phibex Valiant Blitz 91

- “There was no direct com established between the SAD of the DASC and the SAD of the TACC. This caused problems during MEDEVAC missions.”

MCLLS-FTX Betacom 1-91

- “There was much confusion in the early stages of this medevac.”
- “A medevac SOP needs to be written which must include the chain of command launch authority.”

MCLLS-Phibex Ocean Venture 90

- “Due to the initial wave of heat casualties …there were many “no play” medevac requests,..com became distorted, requests inflated and symptoms magnified out of proportion.”
- “The need to relay comm may result in a distortion of initially transmitted data and a delay in medevac response.”

MCLLS-FTX CAO-89

- “After a priority aeromedical evacuation request..one hour and 20 minutes later a non-litter configured UH-1 helo arrived on the scene.”
- “Helicopter evacuation in the FMF is a lift of opportunity and delays should be expected.”

USMC Mission Area 45 (Medical) Analysis 1993

- "Cat II concern: Battalion Aid Stations are unable to keep pace with units supported."
- "Cat I concern: Marine Corps casualty evacuation utilizing organic Marine Corps aircraft is inadequate."
- "Cat I concern: Ground ambulances at echelons 1,2 and 3 are inadequate in numbers, capabilities and distribution."

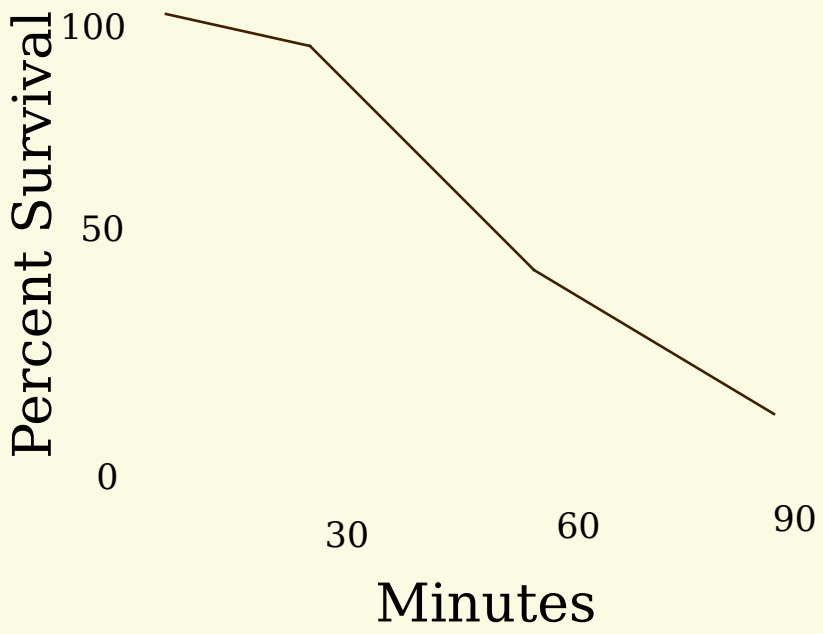
DEPMEDS

- “Initial resuscitation should be prompt, adequate and at the site of injury or as far forward as possible.”
- “These resuscitation efforts should follow ATLS/ACLS standards” modified for the combat field environment
- “Wounded in action and non-battle injuries will be evacuated expeditiously to the appropriate level of treatment for initial wound therapy.”

Categories of Medevac

- Emergency: Critical wound, illness or injury requiring immediate evacuation
- Priority: Serious wound, injury or illness requiring early hospitalization
- Routine: Wound, injury or illness of minor nature requiring other than local medical resources

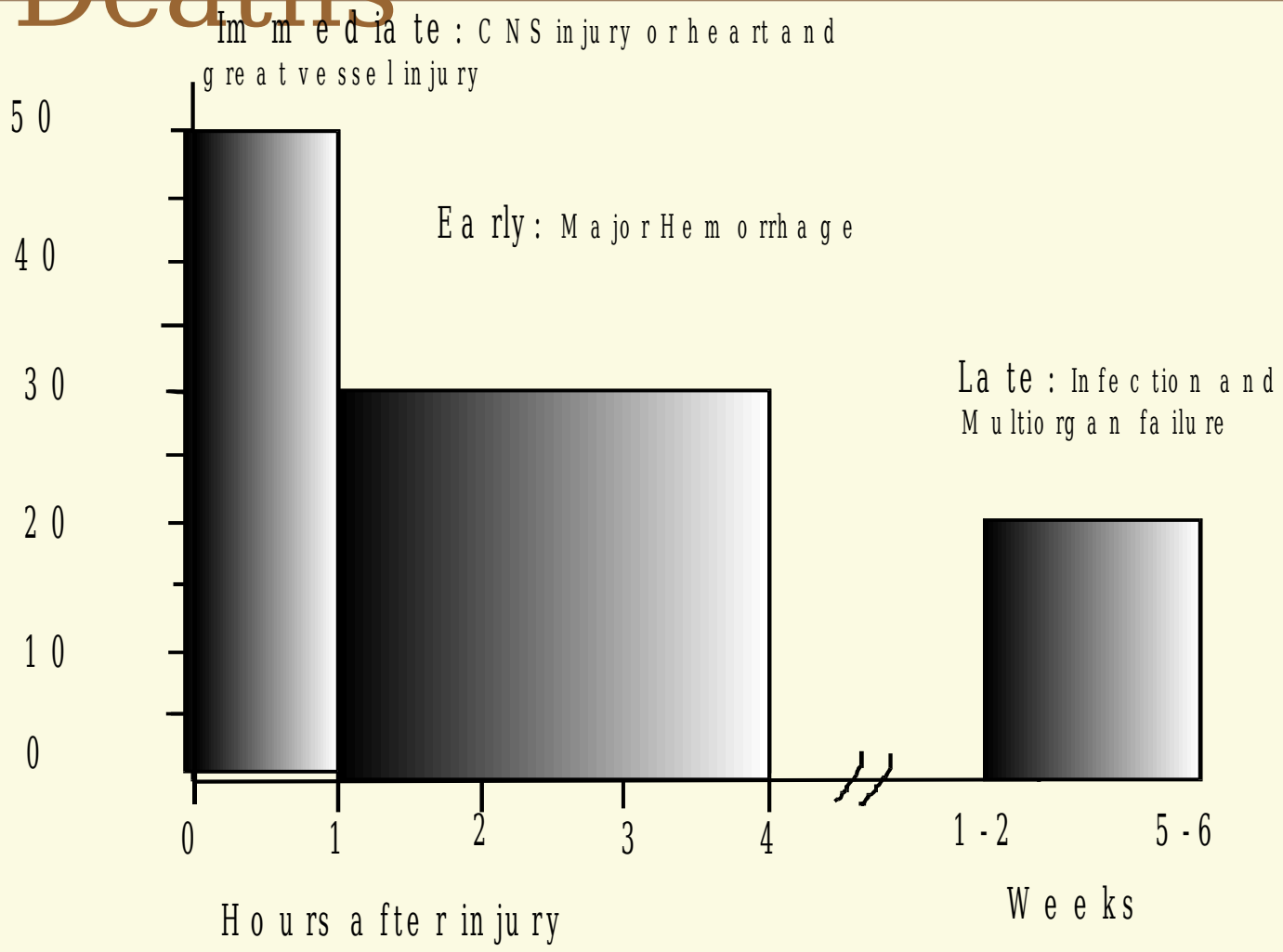
The Golden Hour



The Golden Hour

- As the time between an injured patient developing serious post-traumatic shock and the onset of resuscitation increases, the percentage of surviving patients decreases. The survival rate after 1 hour of severe, untreated shock is very low.

Trimodal Distribution of Deaths



Trimodal Distribution of Deaths

- First peak of deaths occurs with minutes or <1 hour, tears of aorta, heart, brain
- Second peak occurs from 1-4 hours from hemopneumothorax, visceral laceration, major fractures or exsanguination
- Third peak days or weeks later from sepsis, MOS failure

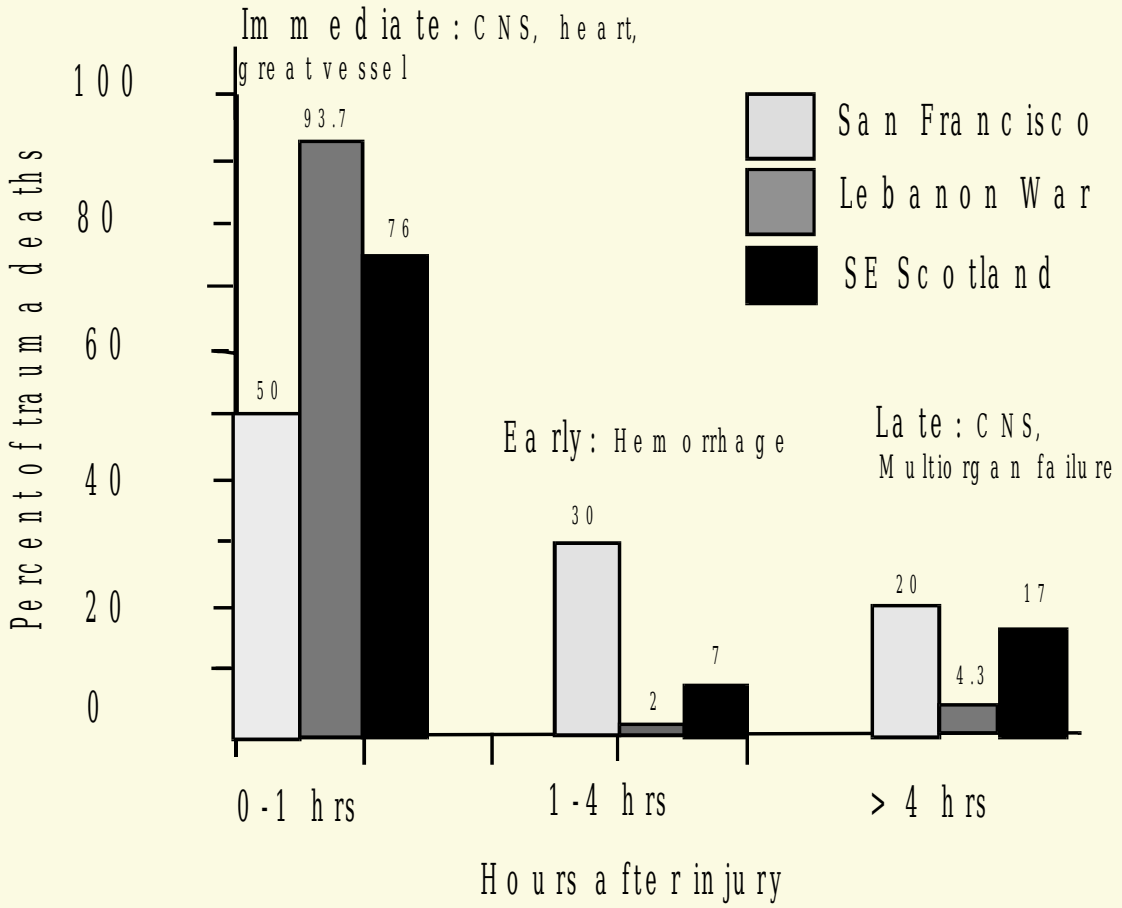
Trimodal Distribution of Deaths

- Second phase are best candidates for salvage with medical evacuation and early surgery for stabilization and resuscitation
- The Far Forward Resuscitative Surgery System (FFRSS) is designed to provide lifesaving hemostasis and respiratory function for evacuation “over the horizon” to CRTS

Reduced Second Phase

- Younger age of wounded (older have higher death rate for same trauma)
- Nature of injury (More instant death reduces second phase deaths)
- More effective medevac system (more survivors) and earlier surgical intervention

Trimodal Distribution of Deaths



Marine Constraints

- Amphibious deck space fixed
- No additional helicopters or tiltwings
- No additional Marine aircrew
- No additional medical personnel
- Minimal additional money
- Modern Maneuver warfare requires responsive casualty evacuation

What about TRAP?

Tactical Recovery of Aircraft and Personnel

1. Secure LZ for aircraft recovery
2. Escort downed crew to the TRAP helicopter
3. Medic, litter, local security, rappel, fastrope, hoist
4. Downed aircraft destruction
5. Ground search for aircrew

VietNam CSAR Experience

- 321 Navy & Marine shot down over NVN
- 60% (192) on ground alive
- 5 of every 6 killed or captured
- 1 CSAR a/c lost per 1.4 recoveries
- 1 CSAR rescuer lost per 1.8 recoveries
- 60% captured within first 10 min.
- 84% captured within 30 minutes

USAF VietNam CSAR Experience

- 4.5 recoveries per CSAR a/c lost
- 5.2 recoveries per CSAR rescuer lost
- USAF had better planning and decision-making-key to success in mission
- “Hasty” TRAP by local forces useful if possible
- No Marine ACE corpsman trained for mission

A Proposed Concept of Medevac

- Operational Maneuver from the Sea
- USMC Ship-To-Objective Maneuver of 25 July 1997
- A Message From the Assistant Secretary of Defense (Health Affairs) of March 20, 1995
- Seabased Logistics, A 21st Century Warfighting Concept
- Concept of Naval Force Health Protection for the 21st Century
- Deployable Medical Platforms Advisory Council
- Joint Health Service Support 2010 Enroute Care Seminar of 12-15 May 1997

Medevac Missions

1. Conserve Military Manpower
2. Timely Movement of Casualties to Appropriate Level of Care (Essential for forward resuscitative surgery)
3. Inter-facility Transfers to Even Casualty Workload (Reduce casualty care waiting time)
4. Inter-facility Transfers to Allow Facility Relocation

Medevac Missions

5. Tactical Recovery of Aircraft and Personnel ??
6. Emergency and Priority Delivery of Medical Supplies, Blood, Etc.
7. Emergency Movement of Medical Personnel
8. NEO Medevac of Casualties

Medevac Missions

9. Amphibious Group Medevac and Navy Battle Force Mass Casualty Emergency Augmentation (While embarked)
10. Humanitarian Operations
11. Initial and Recurrent Training

Medevac Senarios

- Small Unit 24-Hour Coverage
- MEU, MEB and MEF 24-Hour Coverage
- Combat Environment
- Non-Hostile Environment
- Arctic, Desert, Mountains, Jungle, Sea
- Day, Night, Adverse Weather
- Short Distance, Long Distance

Medevac Senarios

Worst Case:

High threat, Adverse Weather, Night (No Lights, NVG), High Vibration, High Noise, Isolated, Long Flight, High acuity patients

Task Organized

- Allow for a/c maintenance availability of 50%
- Small Unit Coverage- 2 a/c, 24 hour coverage
- MEU- 4 CH-46 aircraft, 4 Corpsmen
- MEB*- 4-6 CH-46 aircraft, 4-8 Corpsmen
- MEF- 8 CH-46, 2 CH-53 aircraft,
  24 Corpsmen

* Also called MEF(Forward)

Table of Organization

- Each Marine HMM Squadron (CH-46E)
  - Medical Evacuation is a Primary Mission
  - Three Naval Corpsmen
  - One Naval Flight Surgeon
  - Four Medevac-trained Marine Aircrew as additional qualification

Table of Organization

Each Marine V-22 Squadron

- Medical Evacuation is a Primary Mission
- Three Naval Corpsmen
- One Naval Flight Surgeon
- Add Three Medevac-trained Marine Aircrew as additional qualification

Table of Organization

- Each Marine HMH Squadron (CH-53E)
  - Medical Evacuation is a Secondary Mission
  - Three Naval Corpsmen
  - One Naval Flight Surgeon
  - Add Two Medevac-Trained Marine Aircrew as additional qualification

Flight Corpsman Training

- USMC Field Medical Service School (8404)
- SAR School (8406) or Identified Subset
  NAMI “C” School for Marine corpsman in planning
- Squadron Indoctrination Course (2 weeks)
- En Route Critical Care for FFRSS

Flight Corpsman Equipment

- Lightweight Mobile Trauma Kit
  - Protocol Systems Monitor with:
    - EKG, NIBP, Pulse oximetry, Dual temp probes
    - Laryngoscope & oropharyngeal suction
  - Post-Operative Care Kit
  - In-flight ventilator kit
- Augmentation Kits (I.e., cold weather, etc.)
- All modular, A/C compatible

Aircraft Communications

- ICS stations for 2 medical personnel, one with access to radio transmit and receive
- Dedicated air-ground COM for medical use
- ICS long cord reach to all litter stations and to loading ramp
- Communications protocol and security training for medical personnel

Command and Control

- Currently Medevac aircraft standby specified 24 hr in advance in the Air Tasking Order. No med input to individual mission launch. Need aeromedical input to launch and individual mission decisions
- After casualty pickup, Med Reg gives destination via DASC-more often than not does not happen

Squadron Medevac Training

- Hoist operation, including stretcher hoisting
- Zone markings, litter loading, medical treatment system, aircraft range limitations
- Aircrew coordination
- Mission risk assessment, briefing content, aeromedical consequences of flight
- Pre-hospital inflight trauma care
- SOPs, squadron mission, MEU(SOC), etc.

Squadron Pilot Training

- Orientation to medevacs, medical treatment system organization, facilities, zone markings, litter loading and range effects
- Medical communications, priorities, Medical Regulating functions
- Aircrew coordination for medevacs
- Mission risk assessment, medical coordination

GCE & SSE Medical Training

- Helicopter medevac orientation, capabilities, limitations, zone marking
- GCE Surgeon training as above, and casualty estimation, ACE coordination
- CATF and LFC Surgeons orientation re planning, utilization, ongoing operational casualty estimations
- Forward Resuscitative Surgery Evac Training

Medical Continuity

- Fold Medical Regulating Into Medevac Net and Modify
- Medical Regulator Advises Medevac Crew Regarding CRF Availability
- Standard Casualty Data Capture and Transfer
- End-of-Day Summary to ACE Medical Medevac Coordinator. Problem follow-up

Medevac Asset Sizing

- USMC Task-Organized (MAGTF)
- ACE, GCE, CSSG
- ACE Element Contains Right-Sized Medevac Asset for Associated GCE
- Sufficient Medevac Coverage with A/C Availability as Low as 50%
- Medevac Asset Designated, Distributed Throughout ACE

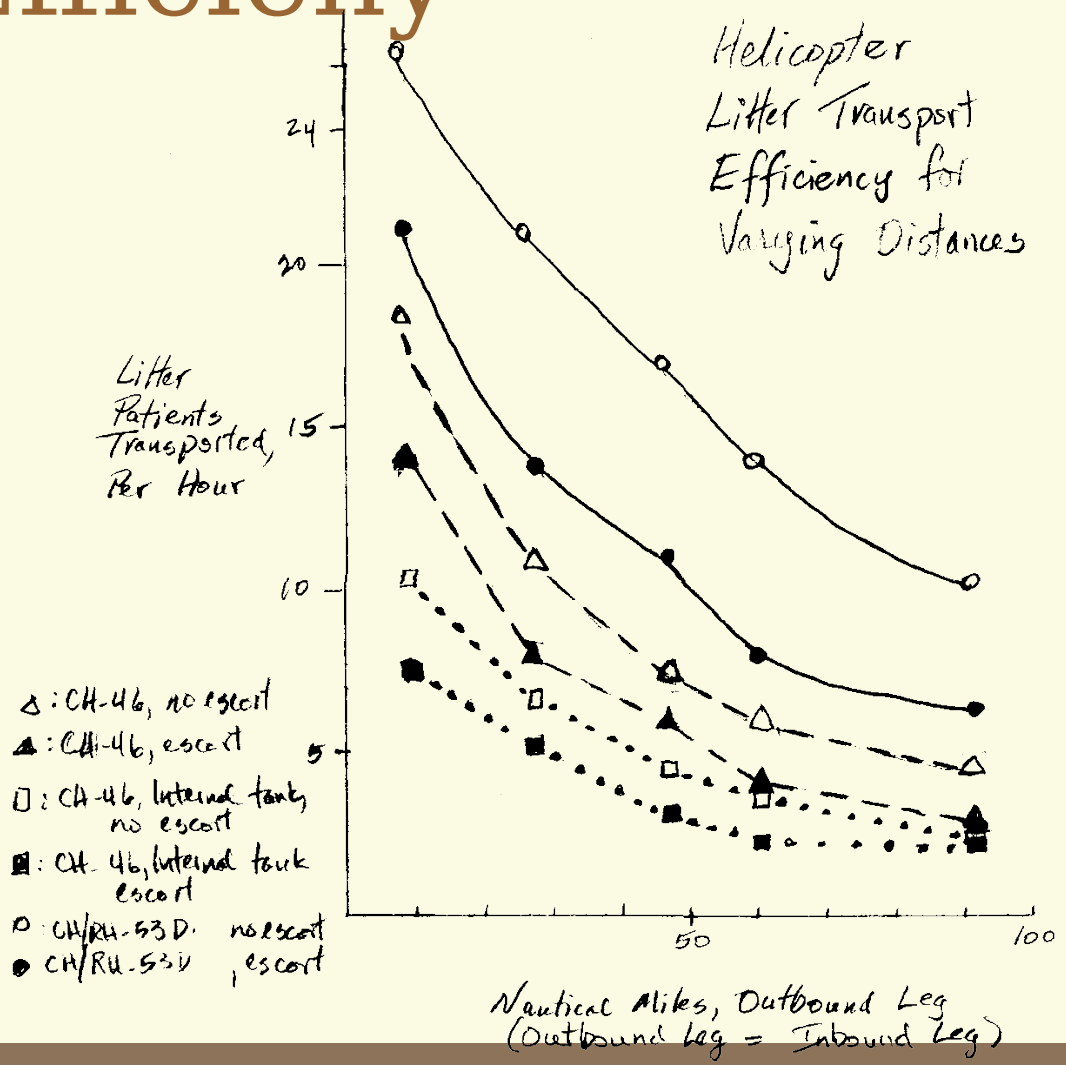
Designated-Distributed vs Dedicated Medevac

- US Army Uses Dedicated Medevac
- USMC Unable Dedicated Medevac
  - 12 HH-60 cost: $205,400,000 to stand up for 1 year (1994)
  - No deck space
  - Inefficient A/C use
  - Designated-Distributed system better alternative

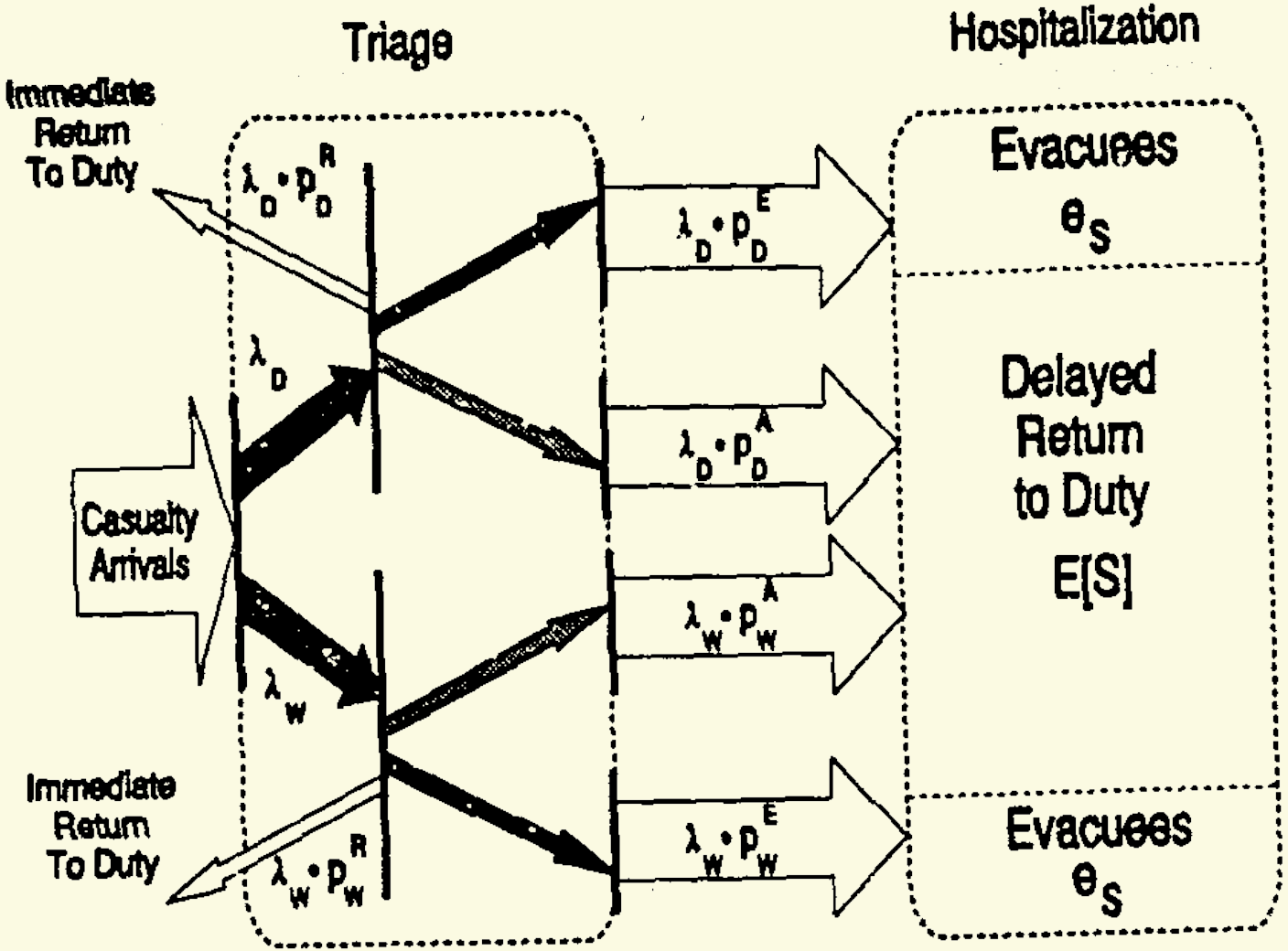
Distributed vs Dedicated Medevac

- $500,000 vs $205,400,000
- 90 Aircraft vs 12 Aircraft
- Greater Surge Capability
- Distributed Pool of Medevac Knowledge
- Aircraft Available for General Assault Support When Not Tasked for Medevac
- Medevac Asset Automatically Sized for GCE

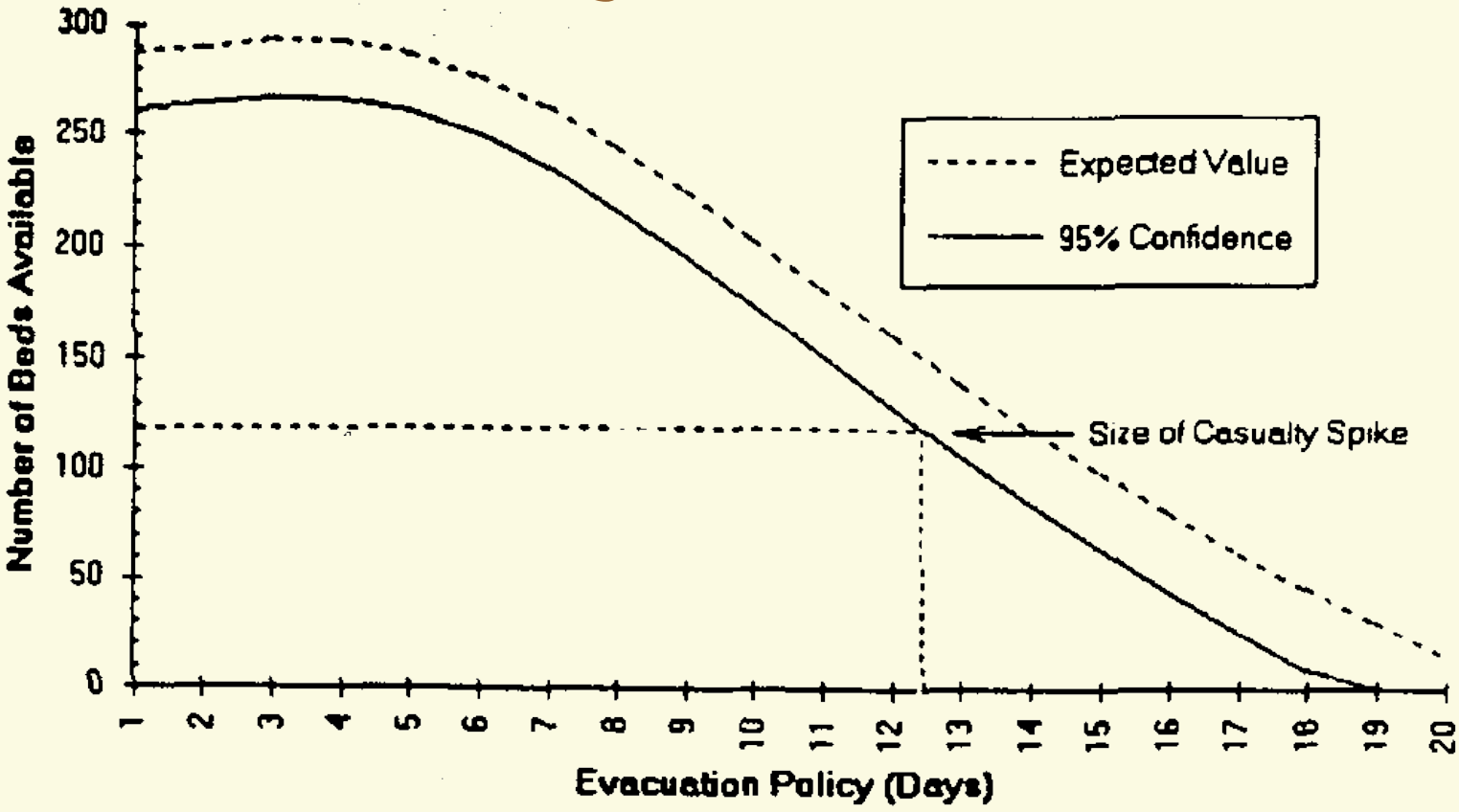
Helo Litter Transport Efficieny

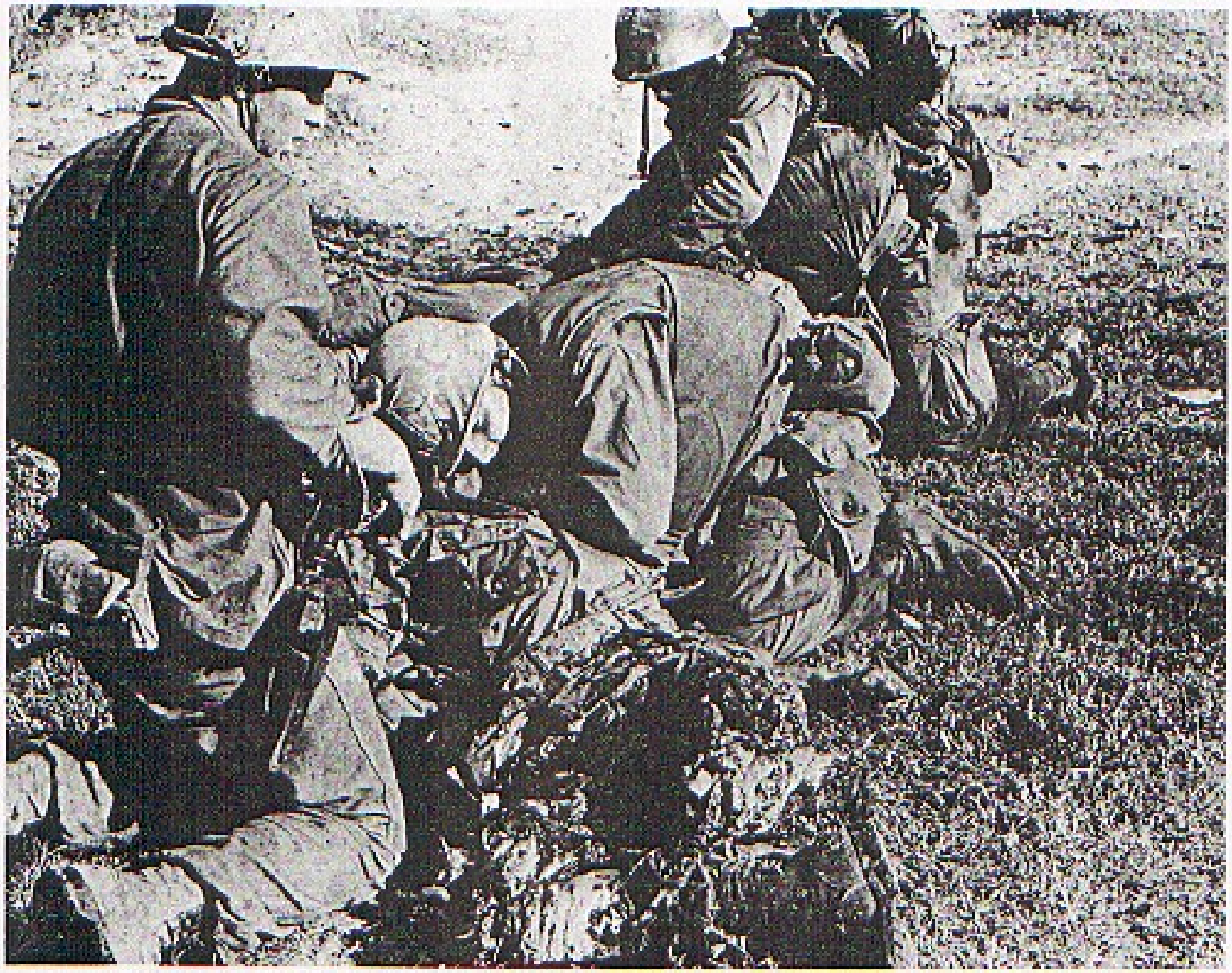


Combat BAS Triage



Evac Policy vs Bed Availability





Corpsmen struggle in vain to save the lives of critically injured Gunnery Sergeant (background) and a medical officer (foreground) in Vietnam. (Official DoD photo, U.S. Marine Corps)